

Expertise Contracting Company



Business Unit

Industrial Services

Document Ref No.:

PR-DIV02-MC-0007

Rev.
No.

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01st August 2016

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Extruder Overhauling



Method of Statement

Site Execution Service, Inspection and Overhaul on Extruder Machines at Unit 42,43 & 44

RFQ # 25000942

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Extruder Overhauling					

1. PURPOSE

- This manual is limited to **Extruder Overhauling** fundamentals, techniques & execution methods.
- The intent is to achieve a consistent, high quality diagnosis, repair and/or overhaul of an Extruder, and to return it to good operating condition with a minimum of delay and cost.
- This Procedure can be used for training as well as for reference.
- This procedure enables Expertise Contracting to comply with its legal duties and obligations.
- To comply and uphold established International \ Local Standards \ Specifications which the Company implements as its commitment.

2. SCOPE

- The Scope of this procedure is bound only to **Extruder Overhauling** the limits of this document others will be waived under Company \ Stakeholder Approval.
- This document outlines and describes the Overhauling Procedure.
- This procedure applies on all sites as well as in house.
- It will also apply to the sub-contractors within our control, on the sites of our clients and on our own premises.
- This document outlines the boundaries and acceptable authority levels required to properly and safely execute intended jobs.

3. RESPONSIBILITIES

- The Immediate Director, Department Manager, Section Heads are responsible for ensuring the commitment, retention and implementation of **Extruder Overhauling**.
- The procedure will cover tasks that are only bound for the description of the procedure therefore procedures which require linking other procedures are only allowed if the Department Manager approves it or either the document suggests it.
- **PROJECT Manager** - The PM/CM shall be responsible for the overall implementation of this work procedure, liaison/co-ordination with Planning and Control department and subcontractor to ensure the efficient execution of work in accordance with the required specifications.
- **Quality Control Manager** - The QCM or his senior delegate shall be responsible to ensure full compliance of the procedure from the concerned department.
- **QC Engineer/Inspector** - QCE and QCI from the Quality control department

Shall be responsible for conducting inspection duties for scope/work as defined in this procedure and efficient recording and reporting of the result as required on a regular basis.

- Functionally report to the PM/CM and shall review the operability of the system.
 - Shall report directly to QAM of Expertise Contracting Company Ltd.
 - Shall receive all requests for inspection (RFI's) from the construction department.
 - The welding quality control inspector shall ensure that all welding activities are performed in accordance with this procedure and client's requirements.
 - Shall carry out planned inspections, surveillance inspections before raising RFI's to client.
 - Shall issue request for inspection (RFI) to the client as defined by the Inspection Test Plan (ITP).
 - Accompany client's representative to carry out routine inspections and get signed various quality records/reports as proof of inspection conforming to specifications.
 - Shall be responsible for maintaining QA Records associated with this procedure.
- **Material Controller** - The material controller with quality control inspector.

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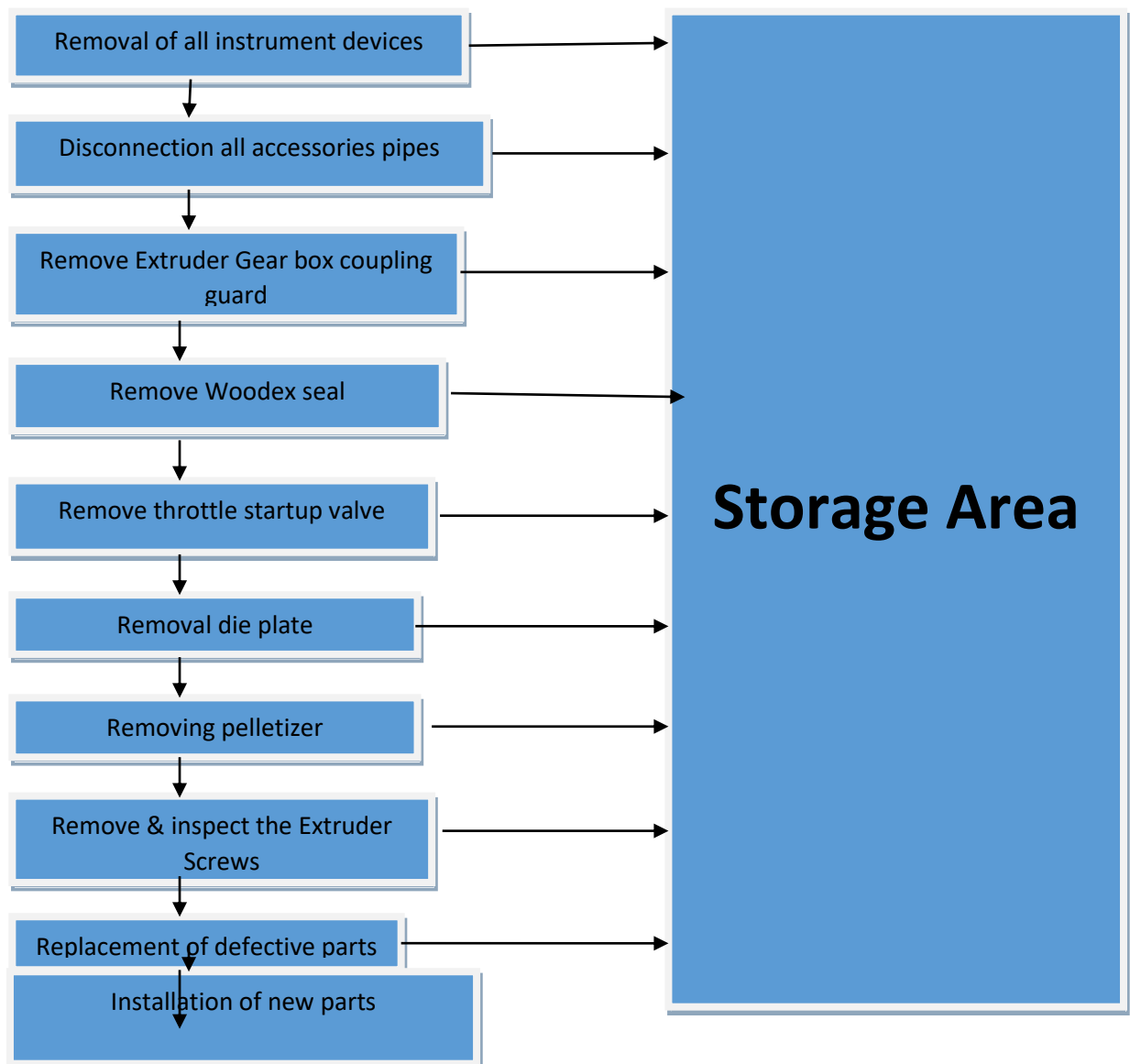
- Shall carry out inspection of the material when material arrives in warehouse.
- The inspector shall ensure the material conforms to the project specification, purchase order and relevant codes and standards.
- The QC inspector shall ensure that all the relevant documentation is available and correct.

➤ **Document Controller** – shall be responsible for:

- The day-to-day activities of the document control office inclusive of the receiving, reproduction, issuing, and transmittal of all documents.
- Maintaining and update of the relevant documents control database.
- Maintaining Records associated with this procedure.

4. METHOD OF STATEMENT:

4.1. Process Flow Chart:



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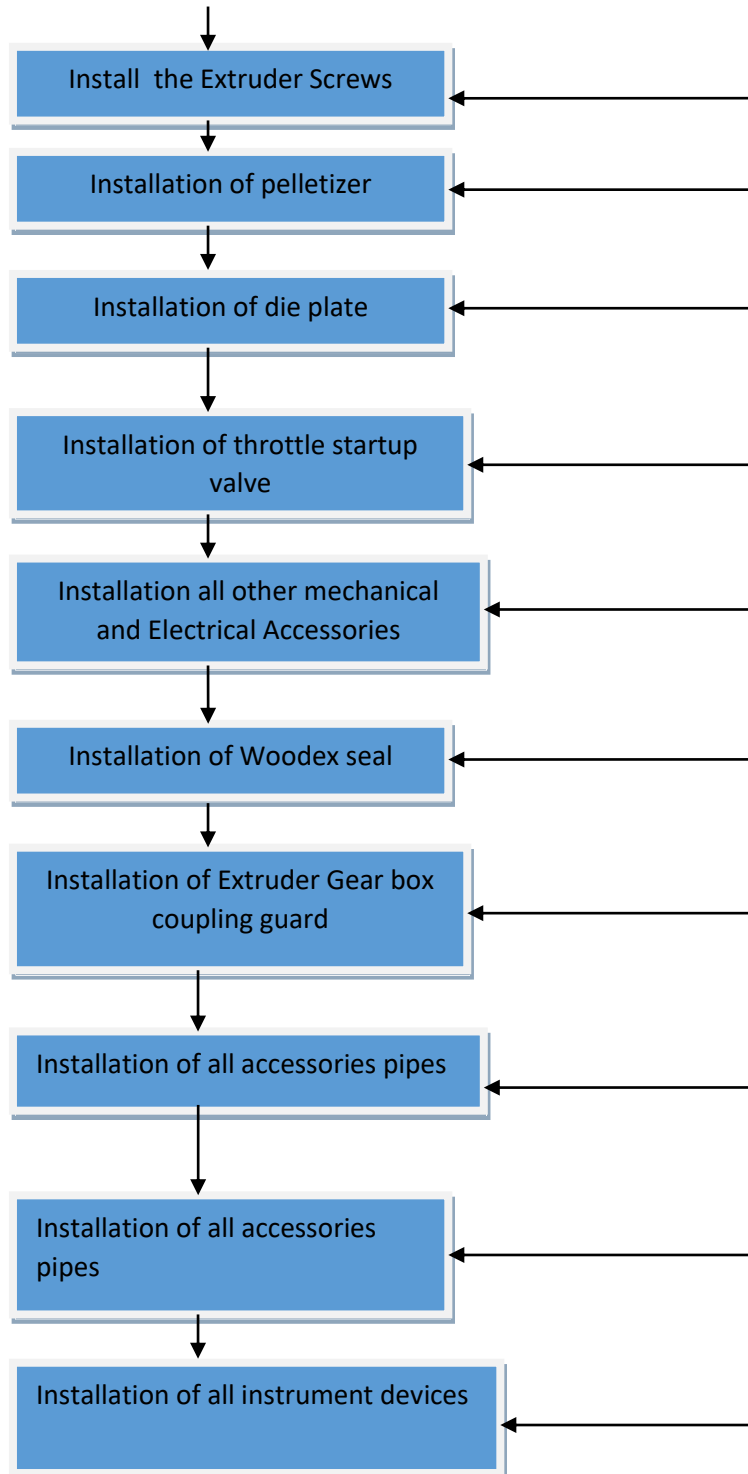
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Storage Area

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4.2. Work Breakdown Structure of Each Activity:

4.2.1. Equipment list:

- 4.2.1.1 Pelletizer – 20,000 kg
- 4.2.1.2 Screen Pack Changer – 20,000 kg
- 4.2.1.3 Shaft Screw – 10,200 kg
- 4.2.1.4 Startup Valve – 3,600 kg
- 4.2.1.5 Die plate – 700 kg
- 4.2.1.6 Die head house – 4,200 kg

4.2.2. Pre Shutdown Activities:

- 4.2.2.1 Ensure timely deputation of manpower, tools & equipments at site
- 4.2.2.2 Obtain safe work permit
- 4.2.2.3 Building up scaffold
- 4.2.2.4 inspection of spare parts
- 4.2.2.5 make sure lifting plan & JSA are approved

4.2.3. Shutdown activities:

- 4.2.3.1 Electrical disconnection of PP Extruder main motor
- 4.2.3.2 Scaffolding erection as required for the task
- 4.2.3.3 Removal of all instrument devices
- 4.2.3.4 Disconnection all accessories pipes
- 4.2.3.5 Remove Extruder Gear box coupling guard & Disconnect coupling
- 4.2.3.6 Disconnect clutch and replace seal element
- 4.2.3.7 Remove Woodex seal & replace it
- 4.2.3.8 Remove & overhaul throttle startup valve & replace if required\
 - Overhaul the hydraulic system of throttle startup valve (cylinders, tubes, pumps, etc.).
 - Replace the defected parts.
- 4.2.3.9 Inspect screen pack changer & replace the elements
- 4.2.3.10 Overhaul the hydraulic system of screen pack changer (cylinders, tubes, pumps, etc.) and Replace the defected parts
- 4.2.3.11 Replace the die plate
 - Inspect the oil manifold for die plate
 - Inspect the pelletizer hood, replace the consumable parts.
- 4.2.3.12 Replace the pelletizer if required
 - Overhaul the hydraulic system of pelletizer (cylinders, tubes, pumps, etc.).
 - Replace the defected parts.
 - Inspect the coupling for pelletizer and gear box as well as motor to gear box coupling.
 - Pelletizer /die plate alignment.
- 4.2.3.13 Remove & inspect the Extruder Screws. Replace with new screws assembly
- 4.2.3.14 Inspection of barrel
- 4.2.3.15 Clean old screws
- 4.2.3.16 Install back all Extruder parts
- 4.2.3.17 Installation of all Instrumentation
- 4.2.3.18 Check as found alignment and correct if required
- 4.2.3.19 Test run with vendor presence
- 4.2.3.20 Housekeeping and Hand over to operation

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5. RISKS ASSESSMENT

- 5.1 The initial risk assessment shall be identified during site visit and client discussion minutes outcomes.
- 5.2 If risk potentiality are identified then a methodology shall be jointly conducted with risk study and results to a mitigation procedure.

6. CUSTOMER SATISFACTION

- 6.1 **Expertise Contracting Company** maintains the satisfaction of its customer ensuring that their Technical, Safety and Services needs are fully meet.
- 6.2 **Expertise Contracting Company** ensures that his client has rights to evaluate our Safety Performance.
- 6.3 If in case **Expertise Contracting Company** having negative feedback from the Client, we ensure that a feedback mechanism to win back their trust must be devised.

7. TRAINING

- 7.1 To have training \ Awareness Program on the Administrative, Technical and Physical implementation of procedures **for Extruder Overhauling**.
- 7.2 Training records issued certificates and attendance must be maintained by the Administrator and the EHSS Representatives of the Company.
- 7.3 The Administrator shall assign with the consent approval by the Department Manager competent Training Facilitator to perform the Awareness \ Training program.

8. CONTACTS INFORMATION

SN	Name	Designation	Email \ Extension \ Mobile
1	Ahmed Metwally	Project Manager	ahmed.metwally@expertindus.com
2	Zachariah M. Thomas	Department Manager	Zachariah.t@expertindus.com

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OVERHAULING PROCEDURE OF GEAR BOX



GEAR BOX OVERHAULING PROCEDURES

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1. PURPOSE

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OVERHAULING PROCEDURE OF GEAR BOX

- This manual is limited to **GEAR BOX OVERHAULING PROCEDURE** fundamentals, techniques & execution methods.
- The intent is to achieve a consistent, high quality diagnosis, repair and/or overhaul of a gear box, and to return it to good operating condition with a minimum of delay and cost.
- This Procedure can be used for training as well as for reference.
- This procedure enables Expertise Contracting to comply with its legal duties and obligations.
- To comply and uphold established International \ Local, Standards \ Specifications which the Company implementing as its commitment.

2. SCOPE

- The Scope of this procedure is bound only to **GEAR BOX OVERHAULING** the limits of this document others will be waived under Company \ Stakeholder Approval.
- This document outlines and describes the Overhauling Procedure.
- This procedure applies on all sites as well as in house.
- It will also apply to the sub-contractors within our control, on the sites of our clients and on our own premises.
- This document outlines the boundaries and acceptable authority levels required to properly and safely execute intended jobs.

3. RESPONSIBILITIES

- The Immediate Director, Department Manager, Section Heads are responsible for ensuring the commitment, retention and implementation of **Gear box Overhauling**.
- The procedure will cover task that only bound for the description of the procedure therefore procedures which requires linking other procedure is only allowed if the Department Manager approves it or either the document suggest it.
- **PROJECT Manager** - The PM/CM shall be responsible for the overall implementation of this work procedure, liaison/co-ordination with Planning and Control department and subcontractor to ensure the efficient execution of work in accordance with the required specifications.
- **Quality Control Manager** - The QCM or his senior delegate shall be responsible to ensure full compliance of the procedure from the concerned department.
- **QC Engineer / Inspector** –QCE and QCI from the Quality control department

Shall be responsible for conducting inspection duties for scope/work as defined in this procedure and efficient recording and reporting of the result as required on regular basis.

- Functionally report to the PM/CM and shall review the operability of the system.
 - Shall report directly to QAM of Expertise Contracting Company Ltd.
 - Shall receive all request for inspection (RFI's) from the construction department.
 - The welding quality control inspector shall ensure that all welding activities are performed in accordance with this procedure and client's requirements.
 - Shall carry out planned inspections, surveillance inspections before raising RFI's to client.
 - Shall issue request for inspection (RFI) to the client as defined by the Inspection Test Plan (ITP).
 - Accompany client's representative to carry out routine inspections and get signed various quality records/reports as proof of inspection conforming to specifications.
 - Shall be responsible for maintaining QA Records associated with this procedure.
- **Material Controller** - The material controller with quality control inspector.

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- Shall carry out inspection of the material when material arrives in warehouse.
- The inspector shall ensure the material conforms to the project specification, purchase order and relevant codes and standards.
- The QC inspector shall ensure that all the relevant documentation is available and correct.

➤ Document Controller – shall be responsible for:

- The day-to-day activities of the document control office inclusive of the receiving, reproduction, issuing, and transmittal of all documents.
- Maintaining and update of the relevant documents control database.
- Maintaining Records associated with this procedure.

4. METHOD OF STATEMENT:

4.1. Dis-Assembling:

- All the inlet and outlet lines should be properly blinded before starting of overhauling job.
- Lube oil piping to and from the bearing and tubing connected to the Gear box should be removed.
- Removal of coupling covers, measuring spacer length and shim pack length and proper locking of coupling shim packs using locking screws should be performed.
- Removal of coupling bolts, coupling spacers after marking is done. Coupling bolts should be removed without any damage.
- DBSE shall be measured and recorded.
- Shaft alignment reading should be recorded by using either dial gauge or Lase alignment.
- The Bull gear and Pinion gear axial float with and without bearings shall be recorded before dismantling.
- The radial bearing clearances should be checked before dismantling.
- All the instrumentation connections on bearings, vibration probes should be removed prior to lifting of bearing housings.
- Record reference readings, clearances at the time of dismantling for both Bull gear and Pinion gear bearings.
- With proper lifting plan both Bull gear and Pinion gear should be lifted from position and placed on wooden sleepers or stand.

4.2. Inspection & Cleaning:

- The Bull gear and Pinion gear rotors shall be inspected for Wearing, Pitting and corrosion.
- The gear teeth should be checked for cracks by performing NDT test.
- Both gears should be cleaned as per the OEM procedure.
- Backlash between gears should be recorded.
- Blue matching of gear teeth with pinion teeth should be performed to check and establish the contact pattern uniformity.
- Cleaning of oil ports and spray nozzles.
- Casing should be thoroughly cleaned and inspected. The casing drains shall be inspected and necessary arrangement should be made for de plugging.
- DPT of casing should be checked.
- Run out reading should be recorded.
- NDT dye penetrant test should be performed on bearings, labyrinth rings.
- Blue matching of bearings with journal should be performed.

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- Dimensional check of bearings and rings should be recorded. If found any abnormality it should be replaced with new one.
- Bottom half casing of gear box should be cleaned without any accumulation dust or corrosion.

4.3. Assembling:

- Both bull gear and Pinion gear should be assembled by mounting on bearings with proper clearances.
- Checking of axial float.
- Alignment of the gear box with driver & driven equipment should be performed as per OEM protocol.
- Alignment reading should be recorded by using dial gauges or Laser alignment kit and if need corrections should be done and it should be witnessed by client.
- The DBSE should be checked and recorded before fixing the coupling spacer.
- Coupling spacer should be inserted and coupling bolts should be tightened using proper torqueing tool and values.
- All the associate piping should be fixed back with new gaskets and molykote coated bolts and tightening of flanges as per bolt tightening sequence.

5. RISKS ASSESSMENT

- 5.1 The initial risk assessment shall be identified during site visit and client discussion minutes outcomes.
- 5.2 If risk potentiality are identified then a methodology shall be jointly conducted with risk study and results to a mitigation procedure.

6. CUSTOMER SATISFACTION

- 6.1 **Expertise Contracting Company** maintains the satisfaction of its customer ensuring that their Technical, Safety and Services needs are fully meet.
- 6.2 **Expertise Contracting Company** ensures that his Client has rights to evaluate our Safety Performance.
- 6.3 If in case **Expertise Contracting Company** having negative feedback from the Client we ensure that a feedback mechanism to win back their trust must be devised.

7. TRAINING

- 7.1 To have training \ Awareness Program on the Administrative, Technical and Physical implementation of procedures **overhauling of gear box**.
- 7.2 Training records, issued certificates and attendance must be maintained by the Administrator and the EHSS Representatives of the Company.
- 7.3 The Administrator shall assign with the consent approval by the Department Manager competent Training Facilitator to perform the Awareness \ Training program.

8. CONTACTS INFORMATION

[Assignment of proper Administrator whom acts and corresponds to the enhancement and proper implementation of this procedure.]

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SN	Name	Designation	Email \ Extension \ Mobile
1			
2			

9. ABBREVIATIONS & DEFINITIONS

9.1	EHSS	– Environment, Health Safety, and Security
9.1	PM	– Project Manager
9.2	CM	– Construction Manager
9.3	QC	– Quality Control
9.4	QA	– Quality Assurance
9.5	QCM	– Quality Control Manager
9.6	QAM	– Quality Assurance Manager
9.7	QCE	– Quality Control Engineer
9.8	QCI	– Quality Control Inspector
9.9	RFI	– Request for Inspection
9.10	ITP	– Inspection Test Plan
9.11	CED	– Cost and Estimation Department
9.12	Ltd.	– Limited
9.13	ASME	– American Society of Mechanical Engineers
9.14	API	– American Petroleum Institute
9.15	NDE	– Non-destructive Examination
9.16	AWS	– American Welding Society
9.17	mm	– Millimeter
9.18	MCC	– Mechanical Completion Certificate
9.19	ECC	– Expertise Contracting Company

10. LINKAGES

SN	Document Linkages	Document Reference No.	Revision Information \ Effective Date
1	Request for inspection	FM-DIV00-QAC-0028	00 \ 01 st August 2016
2	Material Receiving inspection	FM-DIV00-QAC-0006	00 \ 01 st August 2016
3	Punch list	FM-DIV00-QAC-0005	00 \ 01 st August 2016
4	Daily welding inspection report	FM-DIV00-QAC-0010	00 \ 01 st August 2016
5	Non-destructive examination request	FM-DIV00-QAC-0011	00 \ 01 st August 2016
6	Pressure Test Report	FM-DIV00-QAC-0013	00 \ 01 st August 2016
7	Reinstatement and flushing report	FM-DIV00-QAC-0014	00 \ 01 st August 2016
8	Flange Joint Gasket and Bolting Verification	FM-DIV00-QAC-0023	00 \ 01 st August 2016

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11. REFERENCES

- 11.1 Company EHSS Policy
- 11.2 Company EHSS Rules
- 11.3 ISO 9001:2015 Quality Management System
- 11.4 ISO 14001: 2015 Environmental Management System
- 11.5 OHSMS 45001:2018 Occupational Health and Safety Management Systems
- 11.6 Company Project Quality Plan
- 11.7 Approved IFC Drawings
- 11.8 Scope of Work
- 11.9 Project Specifications
- 11.10 API 1104: Welding of pipelines and related facilities
- 11.11 ASME 31.1 : Power Piping
- 11.12 ASME 31.3 : Process Piping
- 11.13 ASME 31.8 : Gas transmission and distribution Piping system
- 11.14 ASME IX : Welding, Brazing and Fusing Qualifications

12. APPENDICES

- APPENDIX A Amendment Record
- APPENDIX B Controlled Copy Repository L

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APPENDIX A

AMENDMENT RECORDS

Change Number	Revision Number	Approved by / Date	Amendment Justification
0	00	Mahammad Ashpak/ 14 th April 2011	Draft issue to document an adaptation of existing stakeholder Procedure
1	01	Mahammad Ashpak/ 30 th May 2020	Updated as per current IMS requirement

Note:

- Change Number and Revision Number are incremental based on the last approved version.
- Approving Authority are solely responsibility of the General Manager and coincidentally the Effective date will be according to the date the document is signed.
- Amendment Justification will be based entirely on the committed changes starting from the Header, Body, Footer and Appendices of the document.

Standardized By:	Approved By:
Zachariah M. Thomas	Mahammad Ashpak
Manager – Rotary service department	Director, Industrial Services Business Unit

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APPENDIX B

CONTROLLED COPY REPOSITORY LIST

Document Pages	System Holder \ Controller	Location
11	File Net Content Manager \ ISO Compliance Specialist	Web based App or Company Portal

Note:

- Document pages refers to the total count of pages a certain document has.
- System Holder \ Controller is referring to the content manager software or Administrator whom directly has jurisdiction of this document.
- Location refers to the storage location which the documents are being safe kept and controlled.

Standardized By:	Approved By:
Zachariah M. Thomas	Mahammad Ashpak
Manager – Rotary service department	Director, Industrial Services Business Unit

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ATTACHMENT LIST

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3	Punch list	00 \ 01 st August 2016	FM-DIV00-QAC-0005
4	Daily weld inspection report	00 \ 01 st August 2016	FM-DIV00-QAC-0010
5	Non-destructive examination request	00 \ 01 st August 2016	FM-DIV00-QAC-0011
6	Pressure Test Report	00 \ 01 st August 2016	FM-DIV00-QAC-0013
7	Reinstatement and flushing report	00 \ 01 st August 2016	FM-DIV00-QAC-0014
8	Flange Joint Gasket and Bolting Verification	00 \ 01 st August 2016	FM-DIV00-QAC-0023

Note:

- Document description refers to the title of related forms or standards which correlates with this procedure.
- Revision Number \ Effective Date these are information which the document current revision and Effective status are noted.
- Linkages \ Attached File refers to the URL or the embedded file itself.

Standardized By:	Approved By:
Zachariah M. Thomas	Mahammad Ashpak
Manager – Rotary service department	Director, Industrial Services Business Unit